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Federal-State Cooperative  
Snow Surveys and Water Supply Forecasts  
for

Rio Grande Drainage Basin

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CURRENT SERIAL RECORD	
★ NOV 9 1956 ★	
U. S. DEPARTMENT OF AGRICULTURE	

SOIL CONSERVATION SERVICE  
UNITED STATES DEPARTMENT OF AGRICULTURE  
AND  
COLORADO AGRICULTURAL EXPERIMENT STATION

Data included in this report were obtained by the agencies named above in cooperation with the U. S. Forest Service, National Park Service, State Engineers of Colorado and New Mexico and other Federal, State and local organizations.

— AS OF —  
MARCH 1, 1955

UNITED STATES DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE

TO RECIPIENTS OF COOPERATIVE SNOW SURVEY  
AND WATER SUPPLY FORECAST REPORTS:

Forecasts by U. S. Weather Bureau of total annual streamflow October-September, inclusive, at more than 300 gaging stations are issued monthly January through May in the publication **WATER SUPPLY FORECASTS FOR THE WESTERN UNITED STATES**.

Weather Bureau forecasts of runoff presented in that bulletin are computed from procedures based on mathematical analysis of the relation between precipitation and runoff.

The Weather Bureau bulletins may be secured by writing to:

Hydrologist in Charge  
River Forecast Center  
U. S. Weather Bureau  
712 Federal Office Building  
Kansas City 6, Missouri

For current information on local river and flood conditions, reference should be made to the appropriate River District Office listed below:

Meteorologist in Charge.....	Pecos River in N. Mex.;
Weather Bureau Airport Station	Rio Grande and tributaries
Albuquerque, N. Mex.	at and above Elephant Butte Dam, N. Mex.

Rio Grande

FEDERAL-STATE COOPERATIVE  
SNOW SURVEYS AND WATER SUPPLY FORECASTS  
for  
RIO GRANDE BASIN

Issued

March 10, 1955

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WATER SUPPLY OUTLOOK  
RIO GRANDE DRAINAGE BASIN  
March 1, 1955

Another year of deficient streamflow is in prospect for the Rio Grande and its tributaries in Colorado. Water supply will again be short in New Mexico. Snow cover in Colorado is about 80 percent of normal and in New Mexico about 70 percent. Soils in irrigated areas are dry. Reservoir storage is much below normal, slightly less than for March 1, 1954.

RIO GRANDE

The water supply outlook for the Rio Grande in Colorado is similar to that for the past five years except 1952. Streamflow will be much below average. February snowfall was high but the seasonal total is only 80 percent of normal on both the Continental Divide and Sangre de Cristo mountains. The most probable flow of the Rio Grande, Alamosa and Conejos rivers into San Luis Valley will be about three-quarters of normal for 1955. This is based on average snowfall for the remainder of the season. This flow estimates exceed to some extent the actual river flow in 1953 and 1954. Storage in irrigation reservoirs in San Luis Valley is low and similar to March 1, 1954. It is close to the amount of water stored a year ago and less than half of the past ten-year average. Soils are dry in the valley.

The water supply for the Rio Grande in New Mexico is poor again this year. Mountain soils are dry on the Rio Chama and Rio Grande watersheds in northern New Mexico. Recent snowfall has been high but there was practically no snow till mid-February. Snow cover as of March 1 ranges from 60 percent of normal on the divide between the Rio Chama and Rio Grande to 80 percent on the Sangre de Cristo range. El Vado reservoir is near empty. Another year of limited water supply is in view for the middle Rio Grande district.

The water available in Elephant Butte and Caballo reservoirs is now about 170,000 acre-feet. This is practically the same as a year ago. Inflow to Elephant Butte is expected to be a little more in 1955 than for last year. The total of storage and expected inflow will probably not be more than one-half of the historical water demand. Extensive pumping will again be necessary. Streamflow below Caballo is the lowest of record. Soil in irrigation areas are dry near Las Cruces and El Paso.

There is very little snow on the headwaters of the Pecos. However, due to the flood on the Pecos River last fall, storage in Alamogordo and McMillan reservoirs is three times that of March 1, 1954 and nearly twice the past ten-year average. The water supply outlook for the Carlsbad Project is good.

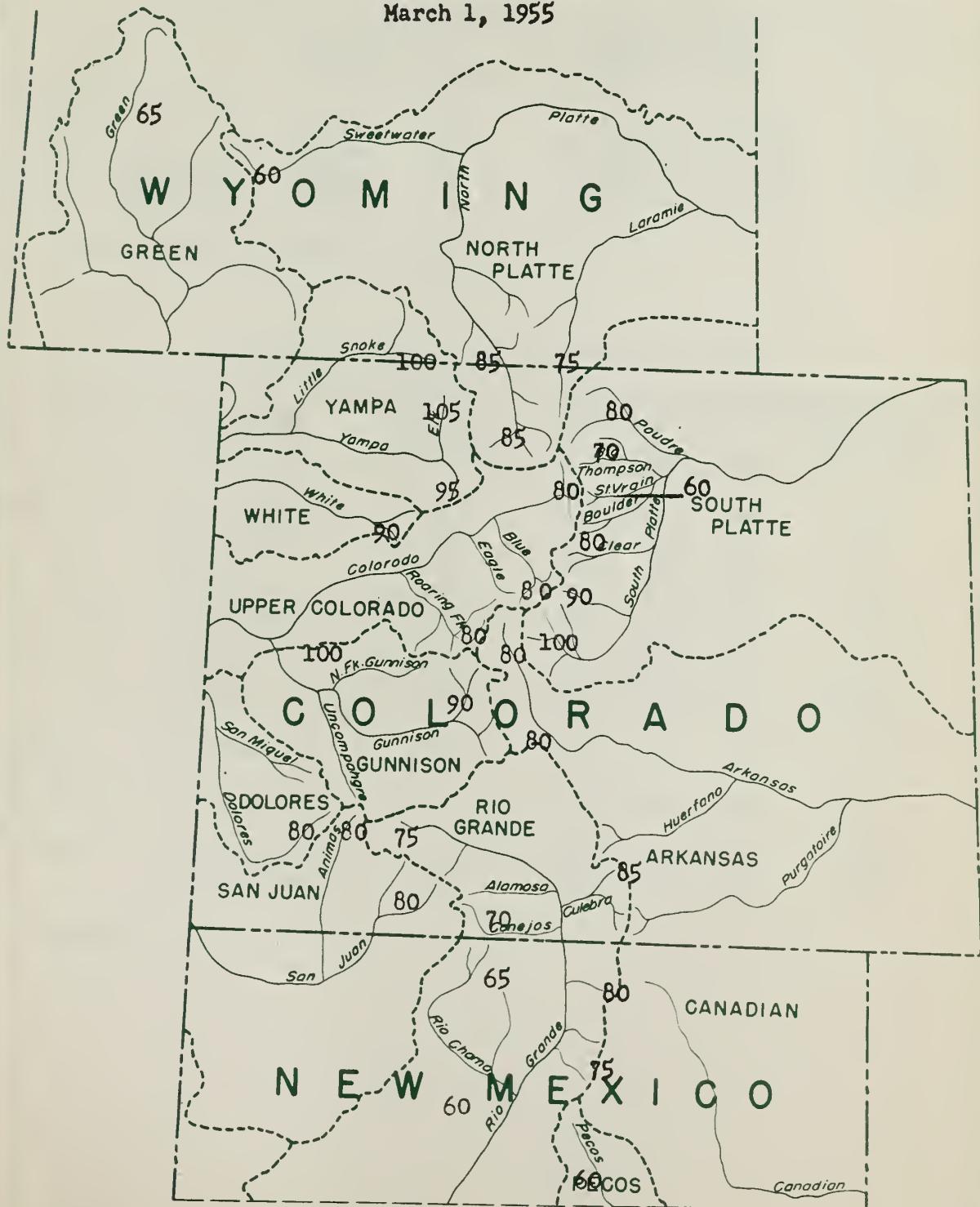
Carry-over storage in Conchas Reservoir for the Tucumcari Project is 145,000 acre-feet as compared to 170,000 a year ago and about one-half of the past ten-year average. Soils are dry and streamflow is below normal. There will probably be a deficiency in water available for irrigation in 1955.

1960-1961

$$F_{\mu\nu}^2 = F_{\mu\nu}^{\alpha\beta} F_{\alpha\beta} = \frac{1}{2} F_{\mu\nu}^{\alpha\beta} F_{\alpha\beta} - \frac{1}{4} F_{\mu\nu}^{\alpha\alpha} F_{\nu\beta\beta}$$

WATER CONTENT OF SNOW ON THE WATERSHEDS OF  
PLATTE, ARKANSAS, UPPER COLORADO AND RIO GRANDE BASINS  
BASED ON SNOW SURVEYS MADE APPROXIMATELY FIRST DAY OF MONTH

In Percent of Normal  
March 1, 1955





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RIO GRANDE DRAINAGE BASIN

STREAM FLOW FORECASTS, March 1, 1955

BASIN AND STREAM	April-September, Incl., Streamflow, Acre Feet				
	Forecast 1955	% of 10 yr. Ave.	Measured 1953	Runoff 1952	10 year Avg. 1943-1952
<b>RIO GRANDE</b>					
Rio Grande at Del Norte	400,000*	76	302,000*	763,000*	529,000*
Conejos at Mogote	140,000	66	143,000	356,000	212,000
Rio Chama at Park View	120,000	59	114,000	372,000	203,000
Rio Grande at Otowi Bridge	350,000*	52	265,000*	1,155,000*	675,000*

\* Including diversions and change in storage.

STATUS OF RESERVOIR STORAGE, March 1, 1955

STREAM	RESERVOIR	USABLE CAPACITY 1000 A.F.	1,000 A.F. Storage, March 1, 1955			10 yr. Avg. 1943-1952
			1955	1954	1953	
RIO GRANDE	Rio Grande	45.0	6.2	5.9	16.5	12.9
	Santa Maria	45.0	2.8	2.4	9.7	9.2
	Sanchez	103.0	3.8	3.6	5.4	10.7
	Terrace	17.7	1.0	1.5	4.7	2.9
	Continental	26.7	3.5	4.9	5.6	9.1
	Platoro	60.0	0.0	0.0	0.0	*
	Elephant Butte	2273.7	150.3	167.6	312.7	766.0
	Caballo	365.0	19.6	17.6	154.1	228.2
CHAMA RIVER	El Vado	226.0	--	3.7	8.0	50.4
CANADIAN RIVER	Conchas	600.0	144.5	167.6	75.6	326.4
PECOS RIVER	Alamogordo	148.0	80.4	39.2	39.0	57.8
	McMillan-Avalon	45.0	34.8	5.1	4.0	10.3

\*Some for shorter periods



RIO GRANDE DRAINAGE BASIN SUMMARY OF MARCH 1 SNOW SURVEYS AND  
 COMPARISON OF DATA WITH PREVIOUS YEARS  
 March 1, 1955

WATERSHEDS	No. of Courses Averaged	Years of Record	March 1, 1955 Water Contents as Percent of		
			1954	1953	Average
Rio Grande (Colo.)	22	4-18	107	100	71
Upper Rio Grande	3	16-18	110	117	78
Alamosa River	2	14-18	105	91	58
Conejos River	5	6-18	116	83	60
Culebra River	1	15	105	108	73
Rio Grande (N.M.)	14	5-18	145	79	75
Chama River	5	5-18	134	84	65
Pecos River	3	13-18	322	52	66
Canadian River	3	13-17	133	--	78

PRECIPITATION DATA

WATERSHED	STATE	Precipitation*	Departure	Precipitation*	Departure
		October 1 to February 28	from Normal	February	from Normal
		Inches	Inches	Inches	Inches
Canadian	New Mexico	3.67	+0.25	0.65	+0.04
Rio Grande	Colorado	--	--	--	--
Rio Grande (N)	New Mexico	2.90	-2.77	1.27	-0.03
Rio Grande (S)	New Mexico	--	--	--	--
Pecos	New Mexico	--	--	--	--

\*Average of Selected High Elevation Stations



RIO GRANDE DRAINAGE SNOW SURVEYS  
March 1, 1955

Drainage Basin and Snow Course	Number	Elev.	Snow Cover Measurements							
			1955			Past record			Years of Record	
			Date of Survey	Snow Depth (In.)	Water Content (In.)	Water Content (In.)	1954	1953		
								Average		
<b>RIO GRANDE IN COLORADO</b>										
Wolf Creek Pass	6M1	10000	2/28	82	18.6	17.2	15.3	23.8	18	
Upper Rio Grande	6M2	9350	3/1	27	4.3	4.5	4.5	6.6	17	
Silver Lakes	6M4	9600	3/1	19	3.7	2.2	3.3	5.5	18	
River Springs	6M5	9300	2/25	20	3.7	3.3	4.6	7.0	18	
LaVeta Pass #2	5M1	9300	2/28	26	7.1	6.1	8.9	7.7	17	
Summitville	6M6	11500	2/24	40	8.3	9.1	9.9	15.2	14	
Cumbres Pass #2(a)	6M7	10000	3/3	52	12.0	7.1	13.0	18.8	18	
Santa Maria	6M8	9700	3/1	19	4.0	2.8	3.4	4.3	16	
Culebra	5M3	10000	2/28	29	6.8	6.5	6.3	9.3	15	
Ft. Garland	5M4	8200	2/28	11	1.8	0.0	NS	2.7	13	
Platoro	6M9	9950	2/25	35	6.9	8.2	12.5	13.8	5	
West Conejos	6M10	9450	2/28	25	4.7	5.2	7.2	10.3	6	
La Manga	6M11	10100	3/3	70	15.4	12.6	13.6	21.3	6	
Pyramid	6M12	10300	2/29	30	6.4	6.1	6.2	8.5	4	
Spr. Creek Pass	6M13	10900	2/27	26	5.4	6.0	4.7	7.8	4	
Pool Table Mt.	6M14	10000	2/28	21	4.3	3.5	3.4	4.9	6	
Lake Humphreys	6M15	9300	2/28	25	5.1	4.8	5.1	6.2	6	
Cochetopa Pass	6L6	10000	2/28	17	4.4	3.8	3.5	4.5	6	
Howardville	7M13	9800	3/1	35	7.0	7.6	7.5	9.1	4	
Red Mt. Pass	7M15	11000	3/1	73	19.1	20.0	18.6	24.2	4	
Porcupine	6M16	10400	2/27	32	6.7	8.8	5.9	9.2	4	
Wolf Creek Summit	6M17	11000	2/28	80	16.1	15.9	13.9	21.8	4	
<b>UPPER RIO GRANDE</b>										
Wolf Creek Pass	6M1	10000	2/28	82	18.6	17.2	15.3	23.8	18	
Upper Rio Grande	6M2	9350	3/1	27	4.3	4.5	4.5	6.6	17	
Santa Maria	6M8	9700	3/1	19	4.0	2.8	3.4	4.3	16	
<b>ALAMOSA RIVER</b>										
Silver Lakes	6M4	9600	3/1	19	3.7	2.2	3.3	5.5	18	
Summitville	6M6	11500	2/24	40	8.3	9.1	9.9	15.2	14	
<b>CONEJOS RIVER</b>										
River Springs	6M5	9300	2/25	20	3.7	3.3	4.6	7.0	18	
Cumbres Pass #2(a)	6M7	10000	3/3	52	12.0	7.1	13.0	18.8	18	
Platoro	6M9	9950	2/25	35	6.9	8.2	12.5	13.8	5	
West Conejos	6M10	9450	2/28	25	4.7	5.2	7.2	10.3	6	
La Manga	6M11	10100	3/3	70	15.4	12.6	13.6	21.3	6	
<b>CULEBRA RIVER</b>										
Culebra	5M3	10000	2/28	29	6.8	6.5	6.3	9.3	15	

(a) Air Observed

NS - No Survey



RIO GRANDE DRAINAGE SNOW SURVEYS  
March 1, 1955

Drainage Basin and Snow Course	Snow Cover Measurements							
	Number	Elev.	Date of Survey	1955		Past Record		Years of Record
				Snow Depth (In.)	Water Content (In.)	Water Content (In.)	1954	
RIO GRANDE IN NEW MEXICO								

CHAMA RIVER

Cumbres Pass#2(a)	6M7	10000	3/3	52	12.0	7.1	13.0	18.8	18
Pay Role	6N1	9700	2/29	23	4.2	3.9	5.4	8.5	14
Chama Divide	6N2	7750	2/26	20	3.4	2.4	4.6	4.9	15
Chamita	6N3	8500	2/26	36	5.5	5.0	7.5	9.4	14
Bateman	6N4	9300	2/29	35	8.6	6.5	9.4	10.0	5

PECOS RIVER

Aspen Grove*	5P1	9500	3/1	14	3.1	2.0	6.5	4.6	18
Panchuela	5P2	9200	2/28	11	2.5	0.6	4.1	3.3	18
Big Tesuque*	5P3	9000	3/1	15	3.2	0.0	6.3	5.2	13

RIO GRANDE

Red River	5N1	9500	2/25	18	5.3	3.4	NS	7.8	17
Taos Canyon	5N2	9000	2/28	18	5.9	3.7	4.9	6.0	17
Aspen Grove	5P1	9100	3/1	14	3.1	2.0	6.5	4.6	18
Tres Ritos	5N4	9000	3/1	20	3.9	3.3	3.9	5.7	17
Pay Role	6N1	9700	2/29	23	4.2	3.9	5.4	8.5	14
Chama Divide	6N2	7750	2/26	20	3.4	2.4	4.6	4.9	15
Chamita	6N3	8500	2/26	36	5.5	5.0	7.5	9.4	14
Cordova (a)	5N5	10100	3/3	39	8.5	5.1	9.1	9.5	13
Panchuela #2	5P2	8500	2/28	11	2.5	0.6	4.1	3.3	18
Big Tesuque	5P3	10000	3/1	15	3.2	0.0	6.3	5.2	13
Elk Cabin	5P4	8350	3/2	12	4.1	0.0	3.3	2.7	7
Rio En Medio	5P5	10400	3/1	23.	4.4	5.3	7.1	6.0	5
Quemazon	6P1	9500	2/28	25	3.9	5.0	7.2	6.3	5
Bateman	6N4	9300	2/29	35	8.6	6.5	9.4	10.0	5
Fenton Hill	6P2	8900	NS	NS	NS	0.9	5.0	--	3

CANADIAN RIVER

Hematite Park	5N3	9500	3/2	12	3.6	3.7	NS	5.2	17
Tres Ritos*	5N4	9000	3/1	20	3.9	3.3	3.9	5.7	17
Cordova*(a)	5N5	10100	3/3	39	8.5	5.1	9.1	9.5	13

\*On adjacent drainage

(a) Air Observed

NS - No Survey

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LIST AND LOCATION OF SNOW COURSES (CONTINUED)

No.	State	Name	Sec.	Twp.	Rge.	Elev.	No.	State	Name	Sec.	Twp.	Rge.	Elev.
<u>Dolores</u>													
7M1	C	Rico	11	39N	11W	8700	6S2	NM	Inman	8	11S	10W	7800
7M2	C	Telluride	6	42N	9W	8600	9S4	A	Nutrioso	23	6N	30E	8500
7M3	C	Lizard Head	24	41N	10W	10300	9S6	A	Beaver Head	13	4N	30E	8000
7M9	C	Trout Lake	8	41N	9W	9700	9S7	A	Corenado Trail	26	5N	30E	8000
							10T2	A	Rose Canyon	15	12S	16E	7300
							10T1	A	Bear Wallow	8	12S	16E	8100
<u>Green</u>													
9G1	W	Mulligan Park	17	36N	108W	8900							
9G5	W	Dutch Joe	33	31N	104W	8700							
10F15	W	Kendall R.S.	23	38N	110W	7900	9R2	A	McMary	14	6N	23E	7200
10F16	W	Loomis Park	14	37N	111W	8500	10R8	A	Forest Dale	2	9N	21E	6900
10G9	W	Snyder Basin R.S.	15	29N	114W	8040	9R1	A	Milk Ranch	28	8N	23E	7000
10G10	W	Piney LaBarge	19	29N	114W	8820	9S5	A	Pacheto				
							9R5	A	Fert Apache	13	7N	27E	9300
							9S1	A	Baldy	28	7N	27E	900
							9S2	A	Maverick Fork	13	6N	27E	905
							10S1	A	Workman Creek	33	6N	14E	5880
<u>UTAH</u>													
<u>Upper Green River in Utah</u>													
10J4	U	Hewinta Ranger Station	33	3N	13E	9500							
10J1	U	Hole-in-the-Rock	13	2N	15E	9150							
10J2	U	Middle Beaver Creek	31	3N	16E	8550	10P2	A	Little Colorado (Arizona)				
10J3	U	Hole-in-the-Rock R.S.	32	3N	16E	8300	11R4	A	Fort Valley	22	22N	6E	7450
9J1	U	Kings Cabin (Upper)	22	1S	21E	8800	11R3	A	Mormon Lake	13	18N	2E	7350
9J2	U	Kings Cabin (Lower)	23&26	1S	21E	8600			Mormon Mountain	14	18N	6E	7500
<u>Duchesne River</u>													
10J8	U	Trail Lake	6	2S	9E	9800	12R1	A	Verde (Arizona)				
11J23	U	Daniels-Strawberry S.	20	2S	12W	8000	11P3	A	Camp Wood	5	16N	6W	6700
11J8	U	Strawberry Divide	34-35	7S	6E	8000	11R2	A	Antelope Park	29	19N	6E	7300
11J7	U	East Portal	36	7S	6E	7560	11R1	A	Casner Park	19	19N	8E	6930
10K1	U	Indian Canyon	2	11S	10E	9100			Munds Park	7	13N	7E	6500
10J9	U	Brown Duck Lake	5	2N	9W	10300							
10J10	U	Lakeferk Mountain	2&3	2N	5W	10500	12R2	A	Williams (Arizona)				
10J11	U	Lakeferk Mountain #2	17	2N	4W	8900	13P1	A	Iron Springs	22	14N	3W	6000
10J12	U	Lakeferk Mountain #3	29	2N	4W	8100			Willow Ranch	1	21N	11W	5000
9J3	U	Paradise Park	7	3N	1E	10500			Lower Colorado (Arizona)				
9J5	U	Mosby Mountain (lower)	5	2N	1E	9500	12P1	A	Chalender	21	22N	3E	7100
							11P1	A	Grand Canyon	21	30N	4E	7500
							12N1	A	Bright Angel	34	3N	4E	8400
<u>Price River</u>													
11K5	U	Huntington-Horsethief	12	14S	5E	9800	6M1	C	Rio Grande (Colorado)				
11K4	U	Geesberry Reservoir	25	13S	5E	8700	6M2	C	Wolf Creek Pass	4	37N	2E	10000
11K3	U	Mammoth R.S. - Cottonwood Cr.	13-28	13S	5E	6800	6M4	C	Upper Rio Grande	13	40W	4W	9350
11K6	U	Mud Creek	4	14S	7E	8250	6M5	C	Silver Lakes	15	36N	5E	9600
11K7	U	Staley Ranch	32	12S	7E	7600	6M6	C	River Springs	25	33N	6E	9300
11K8	U	Dry Valley Divide	20	12S	6E	7800	6M7	C	Summitville	30	37N	4E	11500
							6M8	C	Cumbres Pass	17	32N	6E	10000
							5M3	C	Santa Maria	8	41N	2E	9700
							5M4	C	Culebra	37-23	105.2N		10000
							5M9	C	Fort Garland	13	22N	7W	8200
							6M10	C	Platere	22	33N	4W	9950
							6M11	C	West Conejos	25	35N	4E	9450
							6M12	C	LaManga	11	34N	5E	10000
							6M13	C	Pyramid	25	41N	5W	10300
							6M14	C	Spring Creek Pass	2	42N	3E	10900
							6M15	C	Pecel Fable Mt.	13	41N	2E	10000
							6L6	C	Lake Humphrey	32	40N	1E	9500
							6M16	C	Cochetopa Pass	12	45N	3E	10000
							6M17	C	Porcupine	2	41N	3W	10400
									Wolf Creek Summit	8	37N	2E	11000
<u>San Rafael River</u>													
11K9	U	Seeley Creek R3 #2	25	17S	4E	10000							
<u>Muddy River</u>													
11K14	U	Black Fork	34	20S	4E	9200	5N1	NM	Rio Grande (New Mexico)				
11K15	U	Dills Camp	27	20S	4E	9200	5N2	NM	Red River	29	28N	15E	9200
							5P1	NM	Taos Canyon	10	25N	15E	9000
							5N3	NM	Aspen Grove	12	18N	10E	9100
							5N4	NM	Hematite Park	3	28N	15E	9500
							6N1	NM	Tres Ritos	13	22N	13E	9000
							6H2	NM	Payrole	16	28N	7E	9700
							6N3	NM	Chama Divide	38.9N	106.7W		7750
							5N5	NM	Chamita	36.2N	106.7W		9500
							5P2	NM	Cordova	32	22N	13E	10100
							5P3	NM	Panohuela	27	14N	12E	8300
							5P4	NM	Big Tesuque	17	18N	11E	10000
							5P5	NM	Elk Cabin	8	14N	11E	8250
							6P1	NM	Rio En Medio	8	18N	11E	10100
							6N4	NM	Quemazon	34	20N	6E	9300
							6P2	NM	Bateman	5	28N	6E	9300
									Fenton Hill	18	28N	5W	8900
<u>Escalante River</u>													
11M1	U	Widtsoe-Escalante Sum.	22	34S	1W	9500							
11M2	U	Widtsoe-Escalante #2	22	34S	1W	9500							
<u>Virgin River</u>													
12M6	U	Long Valley Jct	22	38S	6W	7500							
12M5	U	Harris Flat R.S.	24	38S	7W	7700							
12M4	U	Duck Creek R.S.	11	38S	8W	8500							
12M2	U	Midway Valley	26	37S	9W	9400							
12M1	U	Cedar Breaks	2	37S	9W	10390							
12M3	U	Webster Flat	20	37S	9W	9200							
13M1	U	Pine Valley	3	40S	15W	9150							
							5P5	NM	Big Tesuque	17	18N	11E	10000
							6P1	NM	Elk Cabin	8	14N	11E	8250
							6N4	NM	Rio En Medio	8	18N	11E	10100
							6P2	NM	Quemazon	34	20N	6E	9300
									Bateman	5	28N	6E	9300
									Fenton Hill	18	28N	5W	8900
<u>Lower Colorado River (Southeastern Utah)</u>													
9L1	U	LaSal Mountain	5	27S	24E	8800							
9M1	U	Buckboard Flat	36	33S	22E	9000							
							6N4	NM	Bateman	5	28N	6E	9300
							6P2	NM	Fenton Hill	18	28N	5W	8900
<u>Gila (Arizona)</u>													
7S1	NM	Frisco Divide	21	6S	20W	8000							
7S2	NM	State Line	5	6S	21W	8000							
8S1	NM	Taylor Creek	20	10S	10W	7850							



Federal - State - Private

**COOPERATIVE SNOW SURVEYS**

Furnishes the basic data  
necessary for forecasting  
water supply for irrigation,  
domestic and municipal water  
supply, hydro-electric power  
generation, navigation,  
mining and industry

**"WATER IS THE WEST'S GREATEST RESOURCE"**